REV	ECO#	DESCRIPTION OF REVISION
17		IDX-ONLY UPDATE. REDUCED MAX HEIGHT OF MARTY SHIELD COMPONENTS TO 0.65 MM. ADDED SECONDARY FOOTPRINT FOR FULLY SHIELDED FCAM CONNECTOR; REF_DES = J_JFCAM_EVET. ADDED NO-PRESS-NAND SHIELD BENEATH SOC. UPDATED DISPLAY B2B TO 48-PIN AND SHIFTED TO V64 LOCATION. UPDATED SENSOR B2B LOCATION TO MATCH V64 P1. UPDATED S-WIDE B2B TO 0.8H. UPDATED NORTH MOUNTING HOLE SUPER PADS. REDUCED INNER DIAMETER OF MOUNTING WASHERS. EXTENDED FOOTPRINT OF NESSA WASHER. UPDATED REST OF THE SUPER PADS□ SHAPES. DALE_MORGAN 10/15/25
18		REMOVED NO-PRESS-NAND SHIELD BENEATH SOC. UPDATED WASHER HEIGHT SPECS. UPDATED SOC MEASUREMENT. ADDED COPLANARITY SPEC TO WASHERS. ADDED ZERO HEIGHT CONFIG. DALE_MORGAN 10/22/25

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. GEOMETRIC DATA FILES PROVIDED BY APPLE INC. SHALL BE USED FOR MASTER DATA. A DRAWING OF EQUAL FILENAME AND REVISION TO THE GEOMETRIC DATA SHALL BE USED TO DETERMINE GEOMETRIC CHARACTERISTICS AND TOLERANCES. DRAWING DIMENSIONS ARE SUBORDINATE TO GEOMETRIC DATA UNLESS SPECIFIED ON DRAWING TO BE MASTER, AS MAY BE THE CASE OF CABLE LENGTHS OR TABULATED VARIABLE DIMENSIONS. THE SUPPLIER MUST COMPLY WITH THE STANDARDS PERTAINING TO THE TOLERANCE METHOD APPLIED.

2. GD&T - GEOMETRIC TOLERANCE METHODS IN ACCORDANCE TO ASME Y14.5-2009. DATUM REFERENCE FRAMES RANK AS DATUM A PRIMARY, B SECONDARY AND C TERTIARY. FEATURE CONTROL FRAMES MAY RE-ORDER DATUMS PER THE FEATURES DATUM DEPENDENCE. DIMENSIONS THAT LOCATE GEOMETRIC TOLERANCE CHARACTERISTICS ARE BASIC (EXACT). NO TOLERANCES APPLY TO BASIC DIMENSIONS.

3. DIRECT TOLERANCE DIMENSIONING - INTERPRET DIMENSIONS THAT DO NOT LOCATE GD&T CHARACTERISTICS OR GD&T CONTROLLED FEATURES AS THE DIRECT TOLERANCE DIMENSION SYSTEM. THE LOCAL PLUS+/MINUS-, LOCAL LIMIT AND TITLE BLOCK TOLERANCES APPLY.

4. IN THE ABSENCE OF DRAWING DIMENSIONS AND DATUMS, THE GEOMETRIC DATA IS BASIC. THE PLANES OF THE ABSOLUTE COORDINATE SYSTEM DENOTE THE DATUM REFERENCE PLANES AS X-Y = DATUM A, Y-Z = B AND X-Z = C. ALL GEOMETRIC DATA SURFACES ⌓ 0.2 A B C.

5. PERFECT ORIENTATION AND/OR PERFECT LOCATION AT MMC AS REQUIRED FOR THE INTERRELATIONSHIP OF ALL DATUM FEATURES OF SIZE.

6. ON PARTS SUBJECT TO FREE STATE VARIATION, ALL TOLERANCES APPLY WHEN THE PART IS RESTRAINED ACCORDING TO FUNCTIONAL MATING CONDITIONS AS DEFINED BY THE DATUM REFERENCE FEATURE RANK OR FEATURE CONTROL FRAME DATUM RANK PER THE FEATURE INSPECTED. CONSULT PROPER APPLE INC. MANUFACTURING QUALITY ENGINEER (MQE) FOR APPROVAL/CLARIFICATION ON INDIVIDUAL PARTS.

7. TOLERANCES DESIGNATED WITH THE SYMBOL (SPC) SHALL BE PRODUCED WITH STATISTICAL TOLERANCE PROCESS CONTROLS. IN ORDER TO USE THE TOLERANCE ON A FEATURE, THE STATISTICAL PROCESS (CP, CPK, ETC) OF THE PART MUST BE VALIDATED AND APPROVED BY AN APPLE INC. MQE.

8. ALL TOOLING, FIXTURING AND OTHER UNIQUE ITEMS THAT ARE USED TO CREATE THIS PART ARE THE PROPERTY OF APPLE INC. AND SHALL BE PERMANENTLY MARKED WITH APPLE INC.s NAME AND APPROPRIATE APPLE INC. PART NUMBER.

9. THE DESIGN OF ALL TOOLING OR FIXTURING REQUIRED FOR THE MANUFACTURING OR VERIFICATION OF THE PART SHALL BE APPROVED BY THE APPROPRIATE APPLE INC. ENGINEER PRIOR TO TOOL OR FIXTURE FABRICATION.

10. ALL HOMOGENEOUS MATERIALS MUST COMPLY WITH THE FOLLOWING ENVIRONMENTAL SPECIFICATIONS:
    * APPLE INC. REGULATED SUBSTANCES SPECIFICATION, 069-0135
    * ALL ADHESIVES, COATINGS AND PAINTS, PRINTING INKS, AND CLEANING AGENTS USED IN THE MANUFACTURING OF THIS PART MUST COMPLY WITH THE APPLE VOC SPECIFICATION, 099-22549
    * ALL MATERIALS WITH RECYCLED OR RENEWABLE CONTENT MUST COMPLY WITH THE APPLE RECYCLED & RENEWABLE MATERIAL SPECIFICATION, 099-15583

11. REFER TO THE PCB RELEASE PACKAGE PROVIDED BY APPLE INC. FOR MASTER GEOMETRY DATA. THIS DRAWING IS SUPPLEMENTAL TO THE MASTER DATA AND TO BE USED TO INDICATE CRITICAL MECHANICAL FEATURES AND TOLERANCES. TOLERANCES ON THIS DRAWING ARE ONLY INTENDED FOR DIMENSIONS ON THIS DRAWING AND NOT FOR ALL DATA IN THE RELEASE PACKAGE.

12. REFER TO APPLE INC. SPECIFICATION DOCUMENT 062-0073 FOR DESIGN REQUIREMENTS.
    REFER TO APPLE INC. SPECIFICATION DOCUMENT 080-3842 FOR CONNECTOR INSPECTION REQUIREMENTS
    REFER TO APPLE INC. SPECIFICATION DOCUMENT 062-9728 FOR SAFETY REQUIREMENTS

13. BOARD THICKNESS 10 LAYERS: 0.511 +0.040/-0.040 mm METAL-TO-METAL
    SOLDERMASK THICKNESS: 0.018 mm MAX
    STENCIL THICKNESS: 0.06 mm, 0.03 mm REFLOWED MAX SOLDER HEIGHT

14. ALL DESIGNATED MAX HEIGHTS ARE TO INCLUDE THE COMPONENT AT ITS MAX SIZE, SOLDER PASTE AND WARPAGE. HEIGHT MEASUREMENT IS TAKEN FROM TOP OF COPPER (METAL).

15. NO COMPONENT PLACEMENT ALLOWED IN REGIONS SHOWN.

16. APPLY UNDER FILL TO COMPONENTS AS INDICATED.
    INSPECTION: FILLET AROUND 4 SIDES OF PACKAGE TO AT LEAST 1/4 PACKAGE HEIGHT UNDERFILL CONTAMINATION IS NOT ALLOWED IN B2B PINS, TEST POINTS OR EXPOSED COPPER REGIONS USED FOR ASSEMBLY.

17. APPLY ENCAPSULATION TO COMPONENTS AS INDICATED.
    INSPECTION: COMPLETE ENCAPSULATION OF COMPONENTS REQUIRED IN REGIONS SHOWN. ENCAPSULATION CONTAMINATION IS NOT ALLOWED IN B2B PINS, TEST POINTS OR EXPOSED COPPER REGIONS USED FOR ASSEMBLY. ENCAPSULATION SHALL NOT EXCEED THE SPECIFIED HEIGHTS.

18. UNLESS OTHERWISE INDICATED, ALL PANEL TABS TO BE FLUSH/SUB-FLUSH 0.25 mm MAX.
    NO BREAK OUT TAB PROTRUSION ALLOWED PAST OUTLINE.

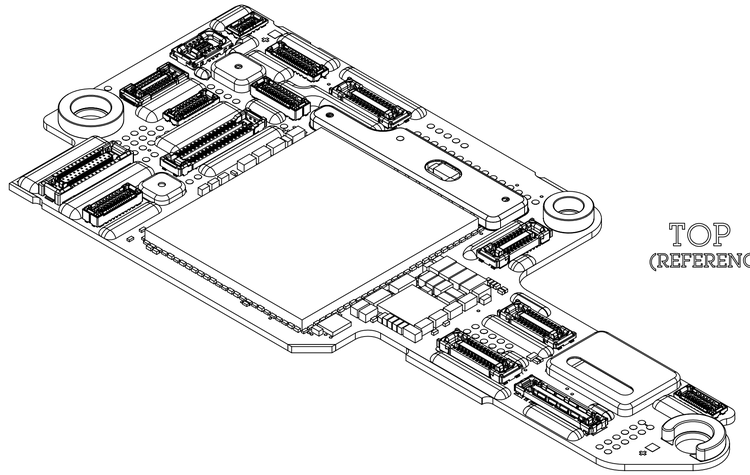
19. VENDOR NAME/INFO, TRACKING CODE, BOARD APN & APPLE INC. LOGO:
    EXPOSED COPPER, ALLOWED ONLY IN INDICATED REGIONS.

20. LASER ETCH BARCODE IN DESIGNATED AREA. AREA TO CONTAIN DATA MATRIX STYLE CODE AND TEXT FOR 18 CHARACTERS, READABILITY PER SPEC ISO 29158, MIN GRADE C.

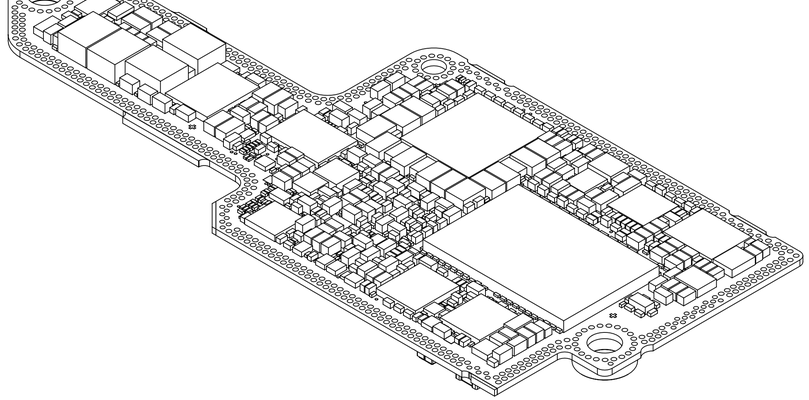
21. STANDOFF TORQUE OUT 1 kgF-cm MIN
    STANDOFF PULL OFF 4 kgF MIN

22. DESTRUCTIVE TESTING CONDUCTED THROUGH PVT-E.
    IN MP, DESTRUCTIVE TESTING REQUIRED FOR LINE QUALIFICATION ONLY.

23. MEASURE MASS OF INDIVIDUAL BOARD (WITH 0.01 g RESOLUTION). (FAI) (DC)
    COLLECT UPON REQUEST.



TOP SIDE
(REFERENCE ONLY)

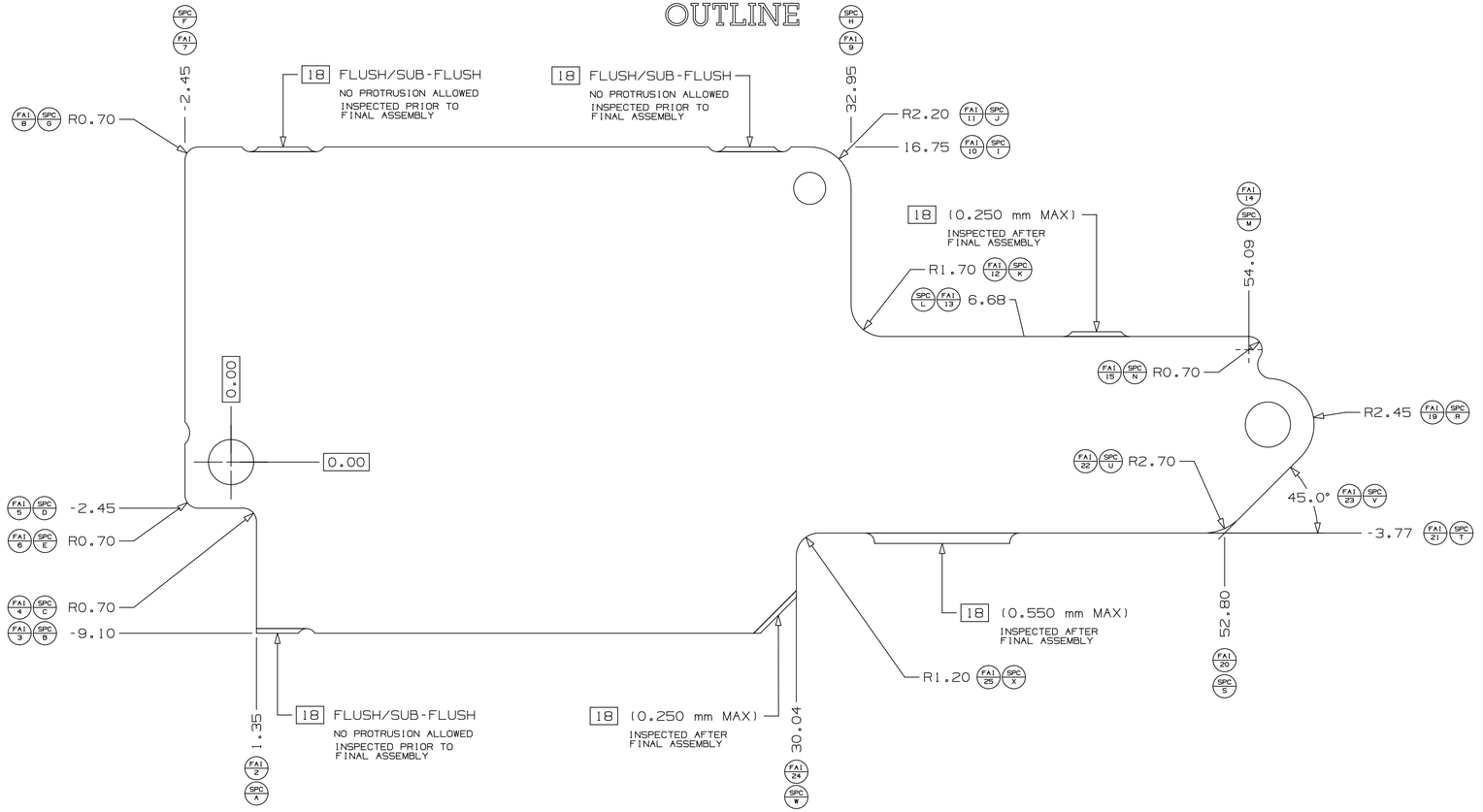


BOTTOM SIDE
(REFERENCE ONLY)

METRIC	Apple Inc.
DRAFTER: APPLE PD — DATE: 05/07/25	NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: (i) TO MAINTAIN THIS DOCUMENT IN CONFIDENCE (ii) NOT TO REPRODUCE OR COPY IT (iii) NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART (iv) ALL RIGHTS RESERVED
DESIGNER: APPLE PD — DATE: 05/07/25	
DIMENSIONS ARE IN MILLIMETERS TOLERANCES X.X ±0.2 X.XX ±0.10 X.XXX ±0.050 ANGLES ±0.5° DO NOT SCALE DRAWINGS	TITLE: MCO,MLB,CG,V6X
	DRAWING NUMBER: 056-23203 — REV.: 18
THIRD ANGLE PROJECTION — SIZE: D	SCALE: NONE — SHT 1 OF 6

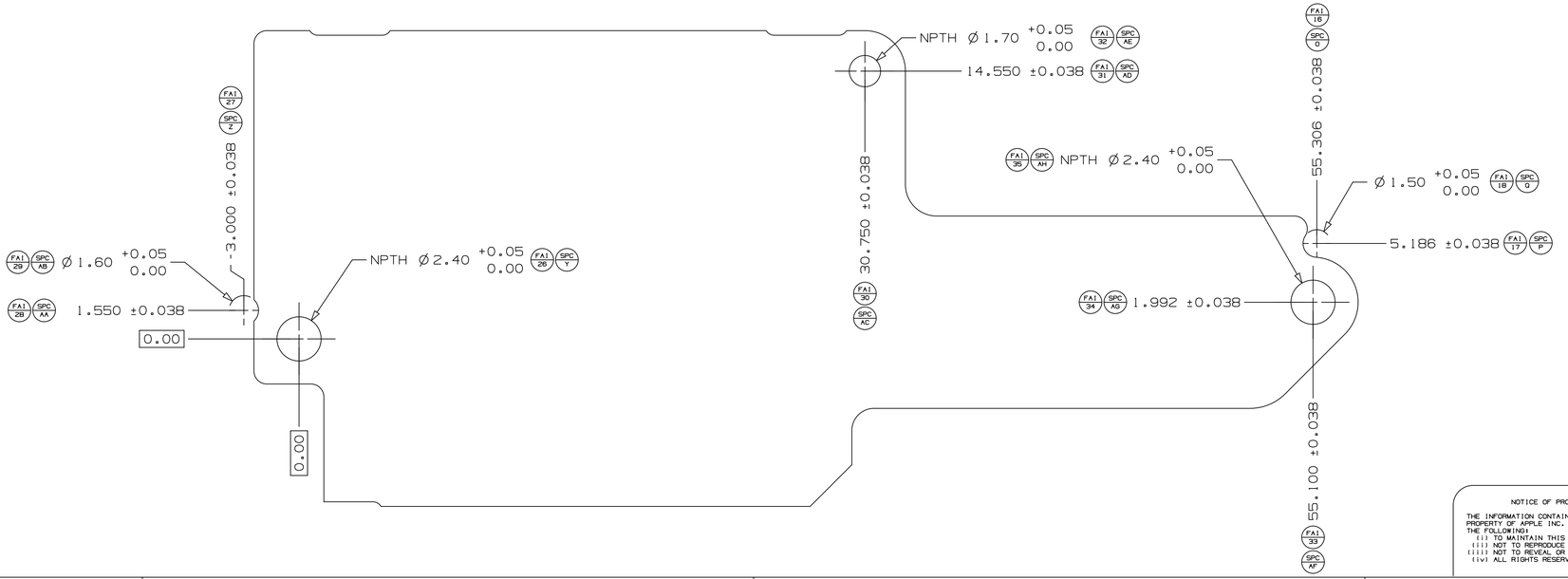
NX GENERATED

OUTLINE



HOLES SIZE & LOCATION

ALL HOLES ARE THRU HOLES UNLESS OTHERWISE NOTED



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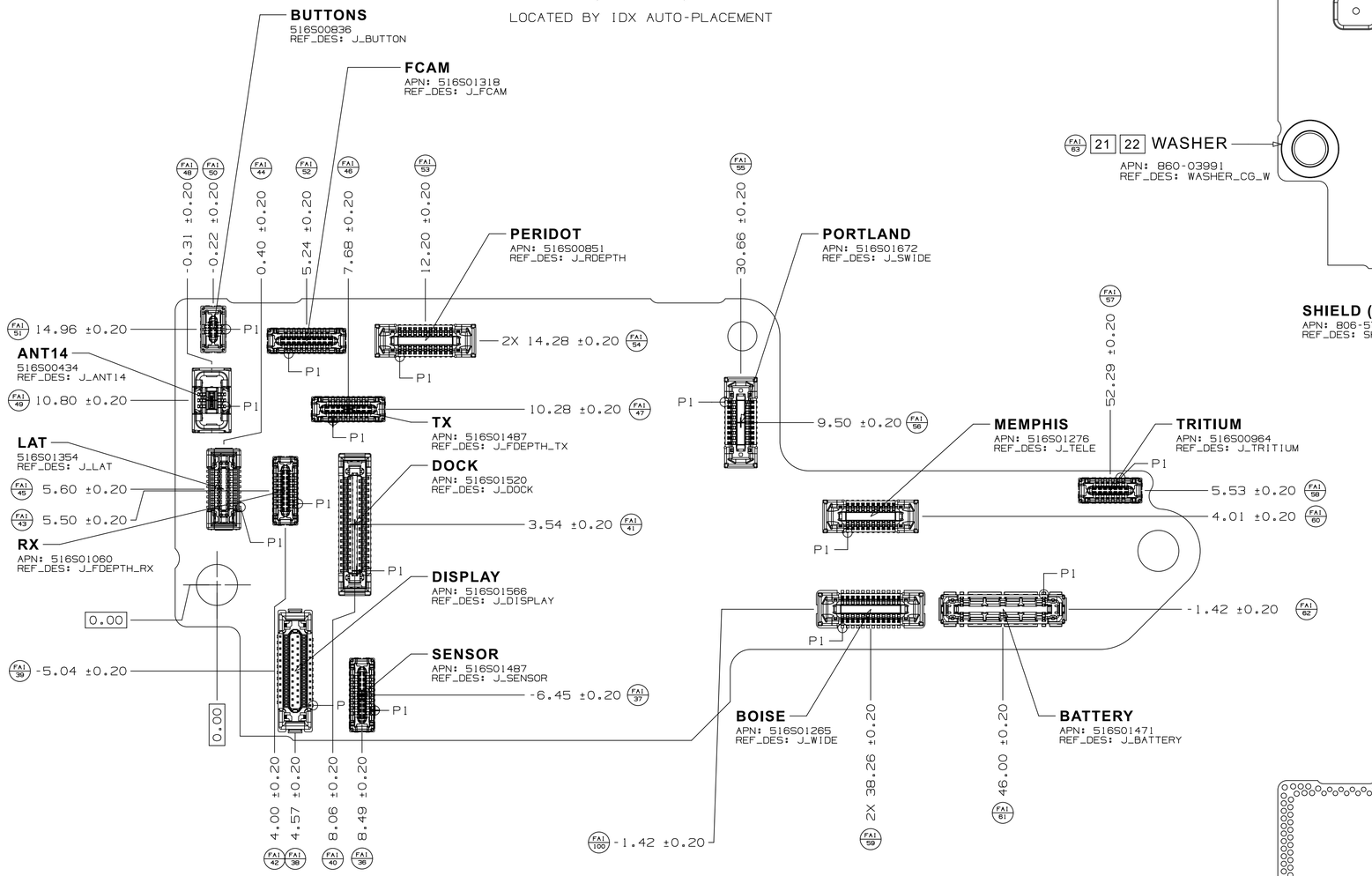
SIZE	DRAWING NUMBER	REV.
D	056-23203	18
SCALE: NONE	SHT 2 OF 6	

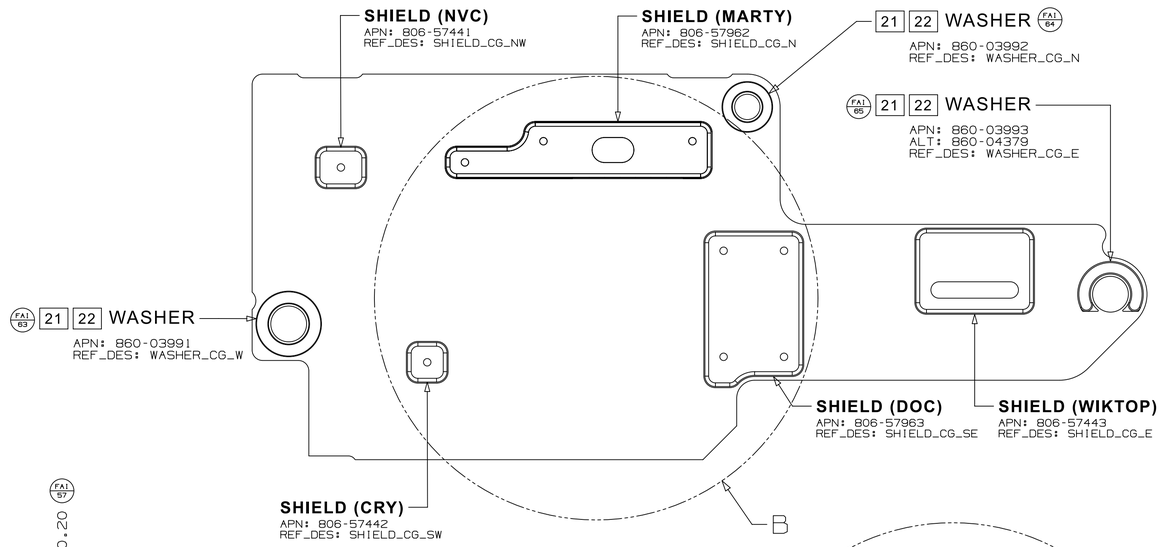
NX GENERATED

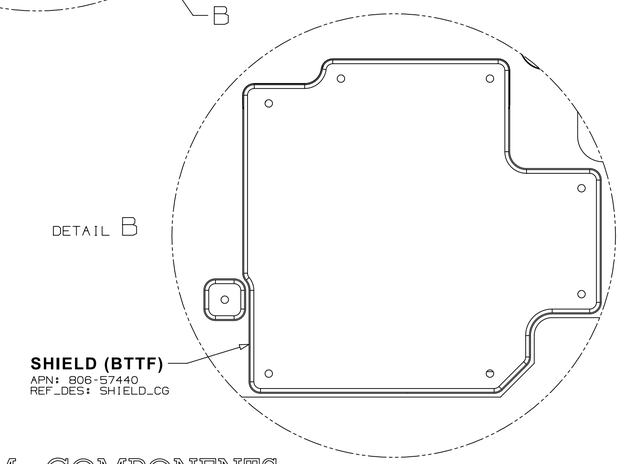
CONNECTOR PLACEMENT
(TOP SIDE)

LOCATED BY IDX AUTO-PLACEMENT



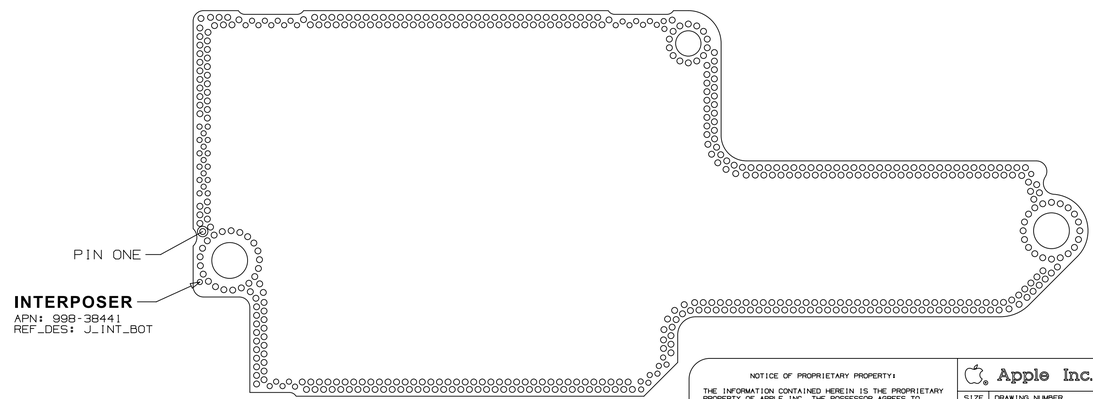
TOP COMPONENTS





BOTTOM COMPONENTS

AS VIEWED THROUGH TOP OF BOARD



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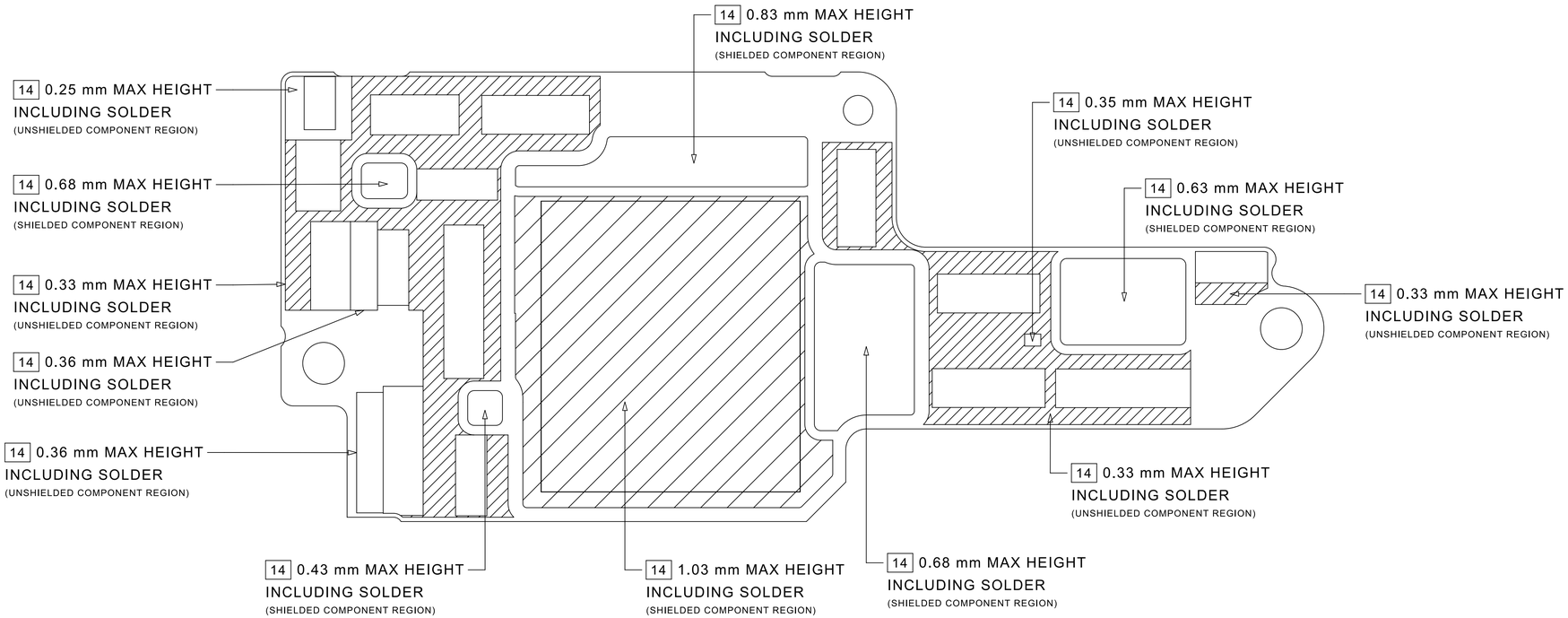
SIZE	DRAWING NUMBER	REV.
D	056-23203	18
SCALE: NONE	SHT 3 OF 6	

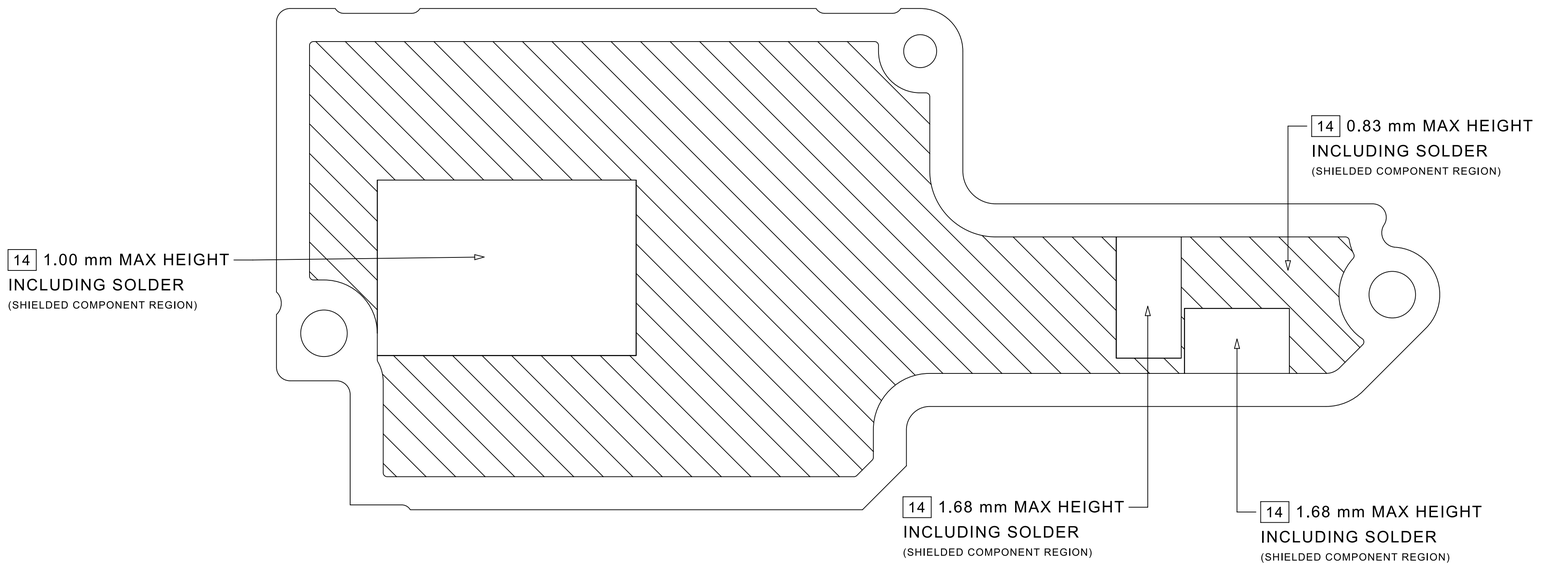
NX GENERATED

RESTRICTED PLACEMENT
(TOP SIDE)



RESTRICTED PLACEMENT
(BOTTOM SIDE)

AS VIEWED THROUGH TOP SIDE



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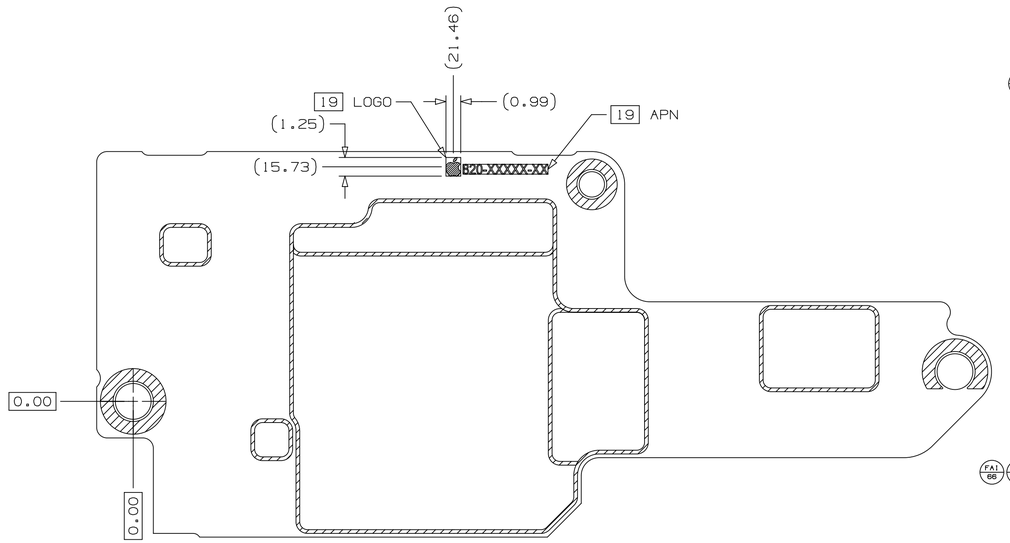
D	056-23203	18

SCALE: NONE SHT 4 OF 6

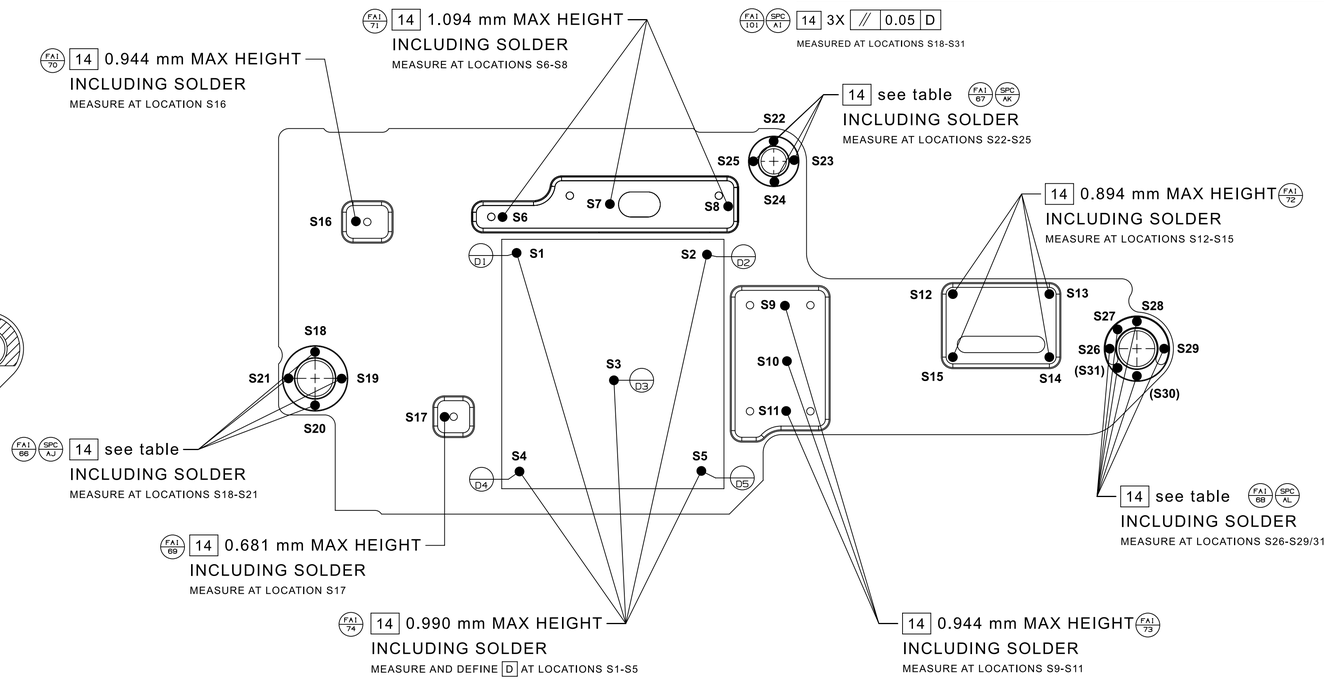
NX GENERATED

EXPOSED COPPER AND MARKING
(TOP SIDE)



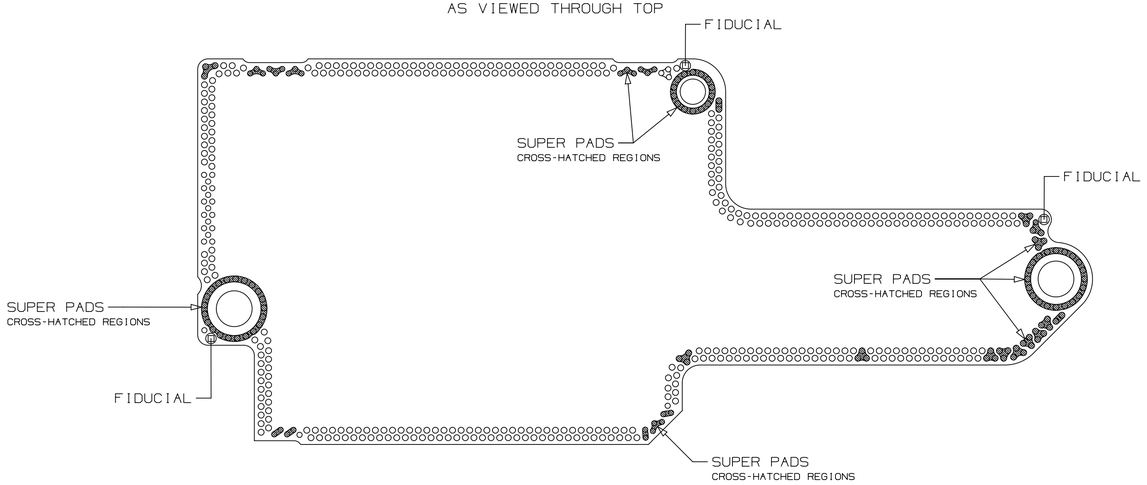
SMT INSPECTION
(SELF-SHIELDED)

	WASHER HEIGHTS mm		
location	zero	external shield (HS)	self-shielded (SS)
nut config	0	25	100
WEST	1.093 ±0.030	1.068 ±0.030	0.993 ±0.030
NORTH	1.093 ±0.030	1.068 ±0.030	0.993 ±0.030
EAST	0.930 ±0.030	0.905 ±0.030	0.830 ±0.030

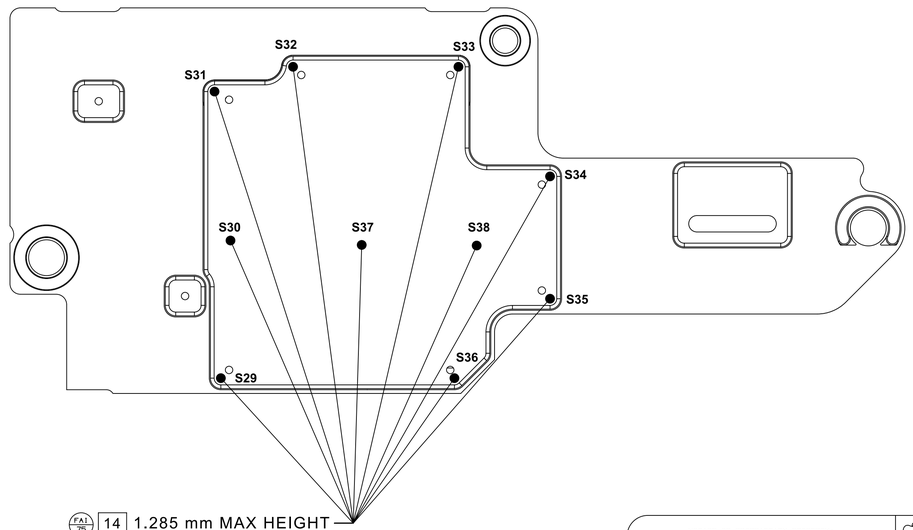


EXPOSED COPPER
(BOTTOM SIDE)

AS VIEWED THROUGH TOP



SMT INSPECTION
(EXTERNALLY SHIELDED)



FAI 75 | 14 1.285 mm MAX HEIGHT
INCLUDING SOLDER
MEASURE AT LOCATIONS S29-S38

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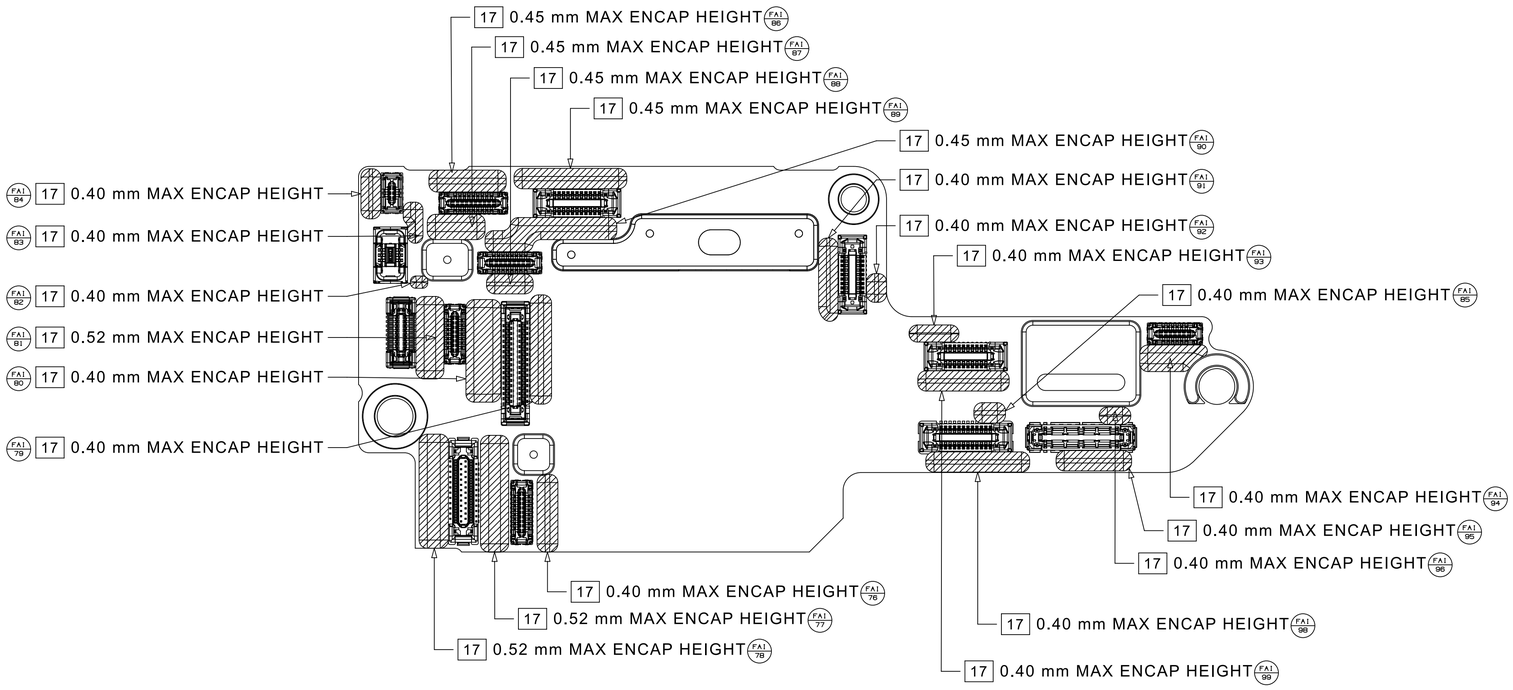
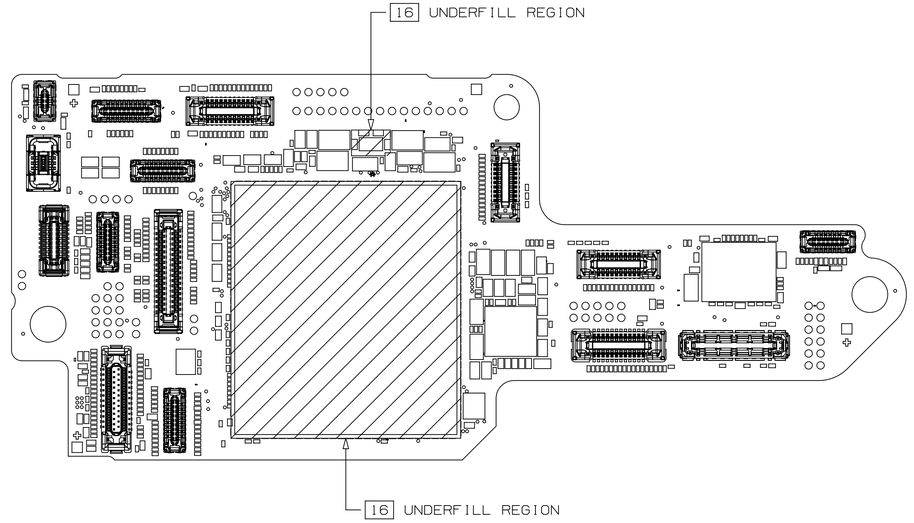
D	056-23203	18
SCALE: NONE	SHT 5 OF 6	

NX GENERATED

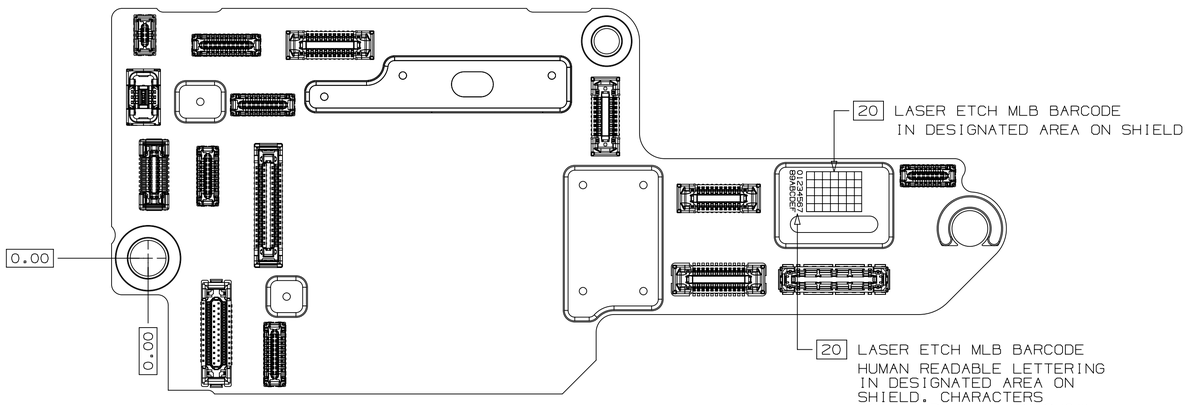
ENCAPSULATION
(TOP SIDE)



UNDERFILL
(TOP SIDE)

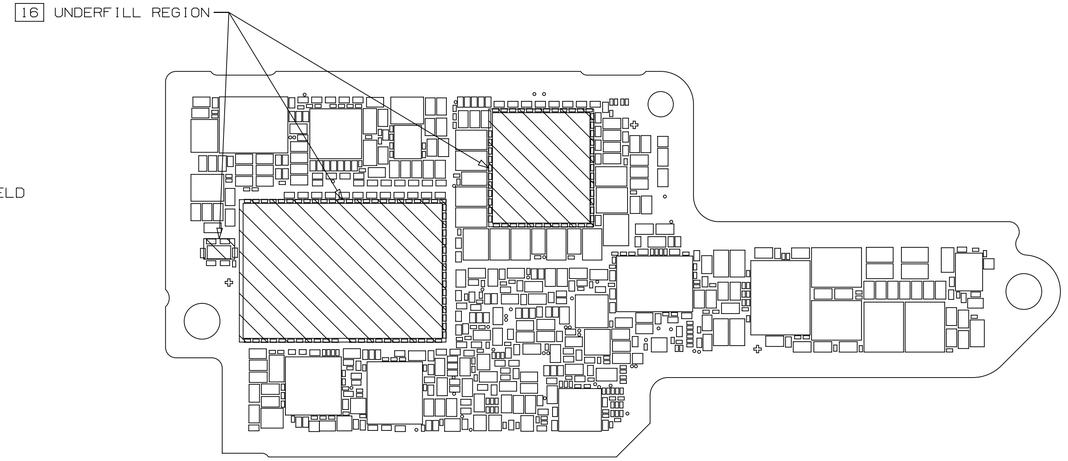


LASER ETCH
(TOP SIDE)



UNDERFILL
(BOTTOM SIDE)

AS VIEWED THROUGH TOP SIDE



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D	056-23203	18
SCALE: NONE	SHT 6 OF 6	